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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/885,409	06/21/2001	Jamal Ramdani	210148US99	3933
	7590 02/04/2003			
OBLON, SP	IVAK, MCCLELLAND	EXAMINER		
1940 DUKE S		SIMKOVIC, VIKTOR		
			ART UNIT	PAPER NUMBER
			2812	
		DATE MAILED: 02/04/2003		

Please find below and/or attached an Office communication concerning this application or proceeding.

		Application No.	Annlicant(s)			
Office Action Summary		Application No.	Applicant(s)			
		09/885,409	RAMDANI ET AL.			
		Examiner	Art Unit			
		Viktor Simkovic	2812			
Period fo	The MAILING DATE of this communication apports r Reply	ears on the cover sheet with th	e corresponaence address			
A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.  - Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.  - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.  - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.  - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).  - Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).  Status						
1)	Responsive to communication(s) filed on 23 C	october 2002 .				
2a)[	This action is FINAL. 2b)⊠ Thi	s action is non-final.				
3)	Since this application is in condition for allowa	nce except for formal matters,	prosecution as to the merits is			
Disposition	closed in accordance with the practice under E on of Claims	Ex parte Quayle, 1935 C.D. 11	, 453 O.G. 213.			
4) 🖂	Claim(s) 21-31 is/are pending in the application	n.				
4	4a) Of the above claim(s) is/are withdraw	n from consideration.				
5)🖂	5) Claim(s) 26-31 is/are allowed.					
6)⊠	Claim(s) <u>21-25</u> is/are rejected.					
7)	Claim(s) is/are objected to.					
	Claim(s) are subject to restriction and/or	election requirement.				
	on Papers					
	The specification is objected to by the Examiner					
10)[1	The drawing(s) filed on is/are: a) accept	•				
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).						
11) The proposed drawing correction filed on is: a) approved b) disapproved by the Examiner.						
If approved, corrected drawings are required in reply to this Office action.  12\\ \sum_ The path or declaration is objected to by the Examiner.						
12) The oath or declaration is objected to by the Examiner.						
Priority under 35 U.S.C. §§ 119 and 120						
13) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).						
a) All b) Some * c) None of:						
	1. Certified copies of the priority documents have been received.					
	2. Certified copies of the priority documents have been received in Application No					
3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)). * See the attached detailed Office action for a list of the certified copies not received.						
14) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).						
a) The translation of the foreign language provisional application has been received.  15) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.						
Attachment(s)						
2) Notice	e of References Cited (PTO-892) e of Draftsperson's Patent Drawing Review (PTO-948) nation Disclosure Statement(s) (PTO-1449) Paper No(s)	5) Notice of Inform	ary (PTO-413) Paper No(s) al Patent Application (PTO-152)			

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### **DETAILED ACTION**

# Claim Rejections - 35 USC § 103

- 1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:
  - (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.
- 1. Claims 21-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bojarczuk et al. in view of Daimon et al. Bojarczuk et al. teach a method of fabricating a semiconductor structure comprising:

providing a silicon substrate having a surface;

forming by ALD a monocrystalline seed layer on the surface of the silicon substrate;

wherein providing a substrate includes providing a substrate having formed thereon a silicon dioxide; and wherein forming by ALD a monocrystalline seed layer includes depositing a layer of a metal oxide onto a surface of the silicon dioxide, flushing the metal layer with an inert gas, and reacting the metal oxide and the silicon oxide to form a monocrystalline silicate.

See Fig. 1, and column 5, line 6, and column 6, lines 2-4. While flushing with an inert gas is not specifically mentioned, the annealing is done in an inert atmosphere, and it is implied that this is done by flushing with an inert gas.

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What Bojarczuk et al. fail to teach is the step of forming by ALD one or more layers of a monocrystalline high dielectric constant oxide on the seed layer. Such a step is taught by Daimon et al. Daimon et al. teach forming a ferroelectric perovksite on top of bismuth silicate, which is formed by a similar process, by reacting a bismuth precursor with a silicon dioxide layer (but no separate annealing step is taught). It would have been obvious to one of ordinary skill in the art at the time of the invention to use this step with the process of Bojarczuk et al., since as Daimon et al. teach, this would allow the integration of a ferroelectric layer with a silicon substrate while matching the lattice constants.

With regard to claim 22, Bojarczuk et al. teach hydrogen passivation of the silicon surface (see column 5, lines 10-13), and then oxidizing the surface to form SIO<sub>2</sub>. With regard to claim 23, Bojarczuk et al. teach forming more than one layer. Claim 24 is just a broader version of claim 22. With regard to claim 25, Daimon et al. teach forming more than one monolayer.

### **Double Patenting**

II. A rejection based on double patenting of the "same invention" type finds its support in the language of 35 U.S.C. 101 which states that "whoever invents or discovers any new and useful process ... may obtain <u>a</u> patent therefor ..." (Emphasis added). Thus, the term "same invention," in this context, means an invention drawn to identical subject matter. See *Miller v. Eagle Mfg. Co.*, 151 U.S. 186 (1894); *In re* 

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Ockert, 245 F.2d 467, 114 USPQ 330 (CCPA 1957); and In re Vogel, 422 F.2d 438, 164 USPQ 619 (CCPA 1970).

A statutory type (35 U.S.C. 101) double patenting rejection can be overcome by canceling or amending the conflicting claims so they are no longer coextensive in scope. The filing of a terminal disclaimer <u>cannot</u> overcome a double patenting rejection based upon 35 U.S.C. 101.

III. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970);and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b)

IV. 37 CFR 1.78(b) provides that when two or more applications filed by the same applicant contain conflicting claims, elimination of such claims from all but one

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application may be required in the absence of good and sufficient reason for their retention during pendency in more than one application.

1. Double-patenting conflicts exist between claims of the following related issued patents and co-pending applications which includes the present application.

Serial Numbers of Related Issued Patents and Co-pending Applications:

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09274268         09758723         09882064         09906730         09911446         09921910         10020898           09425945         09766046         09882067         09906769         09911447         09924481         10020900           09465623         09780119         09884082         09906782         09911448         09927393         10026446           09584601         09795784         09884149         09906783         09911455         09927396         10026812           09607207         09801881         09884150         09906784         09911456         09928356         10053588           09607236         09813779         09884981         09907703         09911457         09929018         10059409           09607237         09822499         09884983         09907704         09911458         09929019         10059411           09607438         09824259         09885409         09907707         09911460         09929021         10076450           09607420         09824376         09897128         09908707         09911464         09929022         10091452           09607722         09824615         09897968         09908883         09911466         09929748         1012540           09608807							
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09625100         09865447         09904892         09910018         09911518         09930444           09629283         09865448         09904894         09910019         09911539         09934836           09642558         09865449         09904895         09910020         09911542         09960402           09656337         09866637         09905098         09910021         09911543         09975930           09662390         09870589         09905110         09910022         09911627         09978096           09669602         09870592         09905115         09910023         09911628         09983326           09678372         09870828         09905116         09910024         09911629         09983854           09689583         09870830         09905863         09910032         09911691         09983866           09712425         09870831         09905869         09910034         09911702         09983866           09712875         09870832         09905902         09910044         09918802         09984471           09721566         09870833         09905930         09910754         09919967         09986024           09733688         09870836         09905932         09910798			<del></del>	09909941	09911517	09930308	
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09678372         09870828         09905116         09910024         09911629         09983854           09689583         09870829         09905863         09910032         09911691         09983859           09692568         09870830         09905868         09910034         09911702         09983866           09712425         09870831         09905869         09910035         09918801         09983869           09712875         09870832         09905902         09910044         09918802         09984471           09721566         09870833         09905903         09910753         09919927         09985757           09733688         09870835         09905930         09910794         09919967         09986024           09740219         09870836         09905932         09910798         09921894         09986034           09740268         09870837         09905934         09911412         09921896         09986899           09753808         09871958         09905935         09911420         09921898         09993514           09755340         09874984         09905980         09911429         09921900         09993523		09870589	09905110	09910022	09911627	09978096	
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09692568         09870830         09905868         09910034         09911702         09983866           09712425         09870831         09905869         09910035         09918801         09983869           09712875         09870832         09905902         09910044         09918802         09984471           09721566         09870833         09905903         09910753         09919927         09985757           09733181         09870834         09905930         09910754         09919967         09986024           09733688         09870835         09905932         09910798         09921894         09986034           09740219         09870836         09905933         09910799         09921895         09986899           09753808         09871958         09905935         09911420         09921898         09993514           09755340         09874984         09905980         09911429         09921900         09993523			09905116	09910024	09911629	09983854	
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09712875         09870832         09905902         09910044         09918802         09984471           09721566         09870833         09905903         09910753         09919927         09985757           09733181         09870834         09905930         09910754         09919967         09986024           09733688         09870835         09905932         09910798         09921894         09986034           09740219         09870836         09905933         09910799         09921895         09986534           09740268         09870837         09905934         09911412         09921896         09986899           09753808         09871958         09905980         09911429         09921900         09993523           09755340         09874984         09905980         09911429         09921900         09993523			<del></del>	09910035	09918801	09983869	]
09721566       09870833       09905903       09910753       09919927       09985757         09733181       09870834       09905930       09910754       09919967       09986024         09733688       09870835       09905932       09910798       09921894       09986034         09740219       09870836       09905933       09910799       09921895       09986534         09740268       09870837       09905934       09911412       09921896       09986899         09753808       09871958       09905935       09911420       09921898       09993514         09755340       09874984       09905980       09911429       09921900       09993523			09905902	09910044	09918802	09984471	
09733181       09870834       09905930       09910754       09919967       09986024         09733688       09870835       09905932       09910798       09921894       09986034         09740219       09870836       09905933       09910799       09921895       09986534         09740268       09870837       09905934       09911412       09921896       09986899         09753808       09871958       09905935       09911420       09921898       09993514         09755340       09874984       09905980       09911429       09921900       09993523			<del></del>	09910753	09919927	09985757	
09733688       09870835       09905932       09910798       09921894       09986034         09740219       09870836       09905933       09910799       09921895       09986534         09740268       09870837       09905934       09911412       09921896       09986899         09753808       09871958       09905935       09911420       09921898       09993514         09755340       09874984       09905980       09911429       09921900       09993523				09910754	09919967	09986024	
09740219       09870836       09905933       09910799       09921895       09986534         09740268       09870837       09905934       09911412       09921896       09986899         09753808       09871958       09905935       09911420       09921898       09993514         09755340       09874984       09905980       09911429       09921900       09993523			<u> </u>	09910798	09921894	09986034	
09753808     09871958     09905935     09911420     09921898     09993514       09755340     09874984     09905980     09911429     09921900     09993523		09870836	09905933	09910799	09921895	09986534	_
09755340 09874984 09905980 09911429 09921900 09993523	09740268	09870837	09905934	09911412	09921896	09986899	_
09700040 09071901 09900900 09911111 00001001 00001006	09753808	09871958	09905935	09911420	09921898	09993514	_
09755341 09882062 09905981 09911444 09921901 09994066	09755340	09874984	09905980	09911429	_		4
	09755341	09882062	09905981	09911444	09921901	09994066	_

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V. While it is true that the Examiner has the burden to show how a rejection is specifically applied to each claim, the exemplary showing with respect to the claims individually discussed below establishes a *prima facie* showing of the unpatentability of the instant claims and is sufficient to give the applicant fair notice of how the rejection is applied to each and every other claim. Further, an analysis of all of the claims in the approximately 330 related applications would be an extreme burden on the Office requiring millions of claim comparisons. Accordingly, the Office is shifting the burden to the applicants to show, if they can, patentable distinctions between the instant claims and those of the other applications and patents. Specifically, in order to resolve the conflict between applications, applicant is required to:

(1) file terminal disclaimers in each of the related, applications terminally disclaiming each of the other approximately 330 applications;

provide a statement attesting to the fact that all claims in the approximately 330 applications have been reviewed by applicant and that no conflicting claims exists between the applications. Applicant should provide all relevant factual information including the specific steps taken to insure that no conflicting claims exist between the applications; or;

resolve all conflicts between the claims in the above identified approximately 330 applications by identifying how all the claims in the instant application are distinct and separate inventions from all of the claims in all of the other approximately 330 identified applications. Note: the examples provided below are merely illustrative of the overall problem. Only addressing/correcting the specifically identified conflicts would **not** satisfy the requirement.

Further, due Applicant's better familiarity with the related applications, Applicant now has the burden of confirming that the preceding list is accurate and complete, or must take appropriate action(s) to assure that no such conflicts exist in any other applications that have been inadvertently omitted from the preceding list, but do in fact possess related subject matter.

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Applicant is reminded that obviousness-type double patenting analysis entails a two-step process: (1) the claims of this application and the other approximately 330 applications must be construed; and (2) the claims of this application must be compared with the claims of the other applications to determine whether the differences in subject matter between the two claims render the claims patentably distinct. See

Georgia-Pacific Corp. v. United States Gypsum Co., 195 F.3d 1322, 1326, 52 USPQ2d 1590, 1593 (Fed. Cir. 1999), and General Foods Corp. v. Studiengesellschaft Kohle, 972 F.2d 1272, 1279, 23 USPQ2d 1839, 1844 (Fed. Cir. 1992). As the Court of Customs and Patent Appeals (CCPA) explained: "[t]he fundamental reason for the rule [against "double patenting"] is to prevent unjustified timewise extension of the right to exclude granted by a patent no matter how the extension is brought about." In re Van Ornum, 686 F.2d 937, 943-44, 214 USPQ 761, 766 (CCPA 1982) (brackets and emphasis in the original) (quoting In re Schneller, 397 F.2d 350, 354, 158 USPQ 210, 214 (CCPA 1968)).

Failure to comply with the above requirement will result in abandonment of the application. However, the requirement will be held in abeyance until allowable subject matter has been indicated by the examiner.

VI. The following claim comparisons are examples of conflicts between three of the copending applications:

S.N. 09/908,892; claims 11

A process for fabricating a semiconductor structure comprising: providing a monocrystalline silicon substrate;

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depositing a monocrystalline perovskite oxide film overlying the monocrystalline silicon substrate, the film having a thickness less than a thickness of the material that would result in strain-induced defects;

forming an amorphous oxide interface layer containing at least silicon and oxygen at an interface between the monocrystalline perovskite oxide film and the monocrystalline silicon substrate;

epitaxially forming a layer of intermetallic compound overlaying the monocrystalline perovskite oxide film; and

epitaxially forming a monocrystalline compound semiconductor layer overlying the layer of intermetallic compound.

#### S.N. 09/755,340; claims 17, 19 and 20:

[Claim 17] A process for fabricating a semiconductor structure comprising the steps of: providing a monocrystalline substrate;

epitaxially growing [an] accommodating buffer layer overlying the monocrystalline substrate;

forming an amorphous layer on the monocrystalline substrate during the growth of the accommodating buffer layer; and

forming a monocrystalline conductive layer over the accommodating buffer layer;

[Claim 19] epitaxially growing an additional monocrystalline layer above the monocrystalline conductive layer;

[Claim 20] wherein the step of [claim 19] includes growing a semiconductor material layer.

#### S.N. 09/986,024; claim 169:

A process for fabricating a semiconductor structure comprising:

providing a monocrystalline silicon substrate;

depositing a monocrystalline perovskite oxide film overlying the monocrystalline silicon substrate, the film having a thickness less than a thickness of the material that would result in strain-induced defects;

forming an amorphous oxide interface layer containing at least silicon and oxygen at an interface between the monocrystalline perovskite oxide film and the monocrystalline silicon substrate; and

epitaxially forming a monocrystalline compound semiconductor layer overlying the monocrystalline perovskite oxide film.

VII. A comparison of the claims shows that all three applications set forth the method steps of providing a monocrystalline substrate; an accommodating buffer (or perovskite)

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layer; an amorphous oxide interface therebetween; and at least a monocrystalline semiconductor layer over the buffer/perovskite. The respective sets of claims are not identical because:

- A. Claims 17, 19 and 20 of the '340 application are broader than claim 11 of the '892 application because the '340 claims do not further require that the monocrystalline substrate be Si; that the amorphous oxide interface layer also contain silicon; that the accommodating buffer specifically be a monocrystalline perovskite; that the conductive layer specifically be an intermetallic compound; nor that the monocrystalline semiconductor layer be a compound monocrystalline semiconductor layer.
- 1. Claim 169 of the '024 application is broader than claim 11 of the '892 application because the '024 claim does not require the additional presence of the epitaxially grown intermetallic compound layer.
- VIII. Accordingly, claims 17, 19 and 20 of the '340 application are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 11 of the copending '892 application. Although the conflicting claims are not identical, they are not patentably distinct from each other because claim 11 of the '892 application anticipates claims 17, 19 and 20 of the '340 application as explained above. See e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985) for the proposition that an obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but an examined

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application claim is not patentably distinct from the reference claim(s) because the examined claim is either anticipated by, or would have been obvious over, the reference claim(s). This is a <u>provisional</u> obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

- IX. Similarly, claim 169 of the '024 application is rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 11 of the copending '892 application. Although the conflicting claims are not identical, they are not patentably distinct from each other because claim 11 of the '892 application anticipates claim 169 of the '024 application as explained above. This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.
- 1. While not specifically addressed herein, similar double-patenting conflicts also exist between the product claims of various applications as well. Moreover, while the Office has a long established policy of generally requiring restrictions between semiconductor product claims (class 257) and method claims (class 438) in a given application, this policy does not negate Applicant's responsibility for ensuring that no conflicts exist between those applications presenting product claims and those applications presenting method claims. This is because it is also well established agency policy that restricted product and method claims may be subject to rejoinder during the course of prosecution. See MPEP 821.04.

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## Allowable Subject Matter

Claims 26-31 are allowed.

The following is a statement of reasons for the indication of allowable subject matter: Prior art of record fails to teach the method of forming a high-k oxide materials by ALD on top of a silicon substrate, using an intermediate layer of either hafnium, strontium or zirconium silicon oxide in between the high-k oxide and the silicon substrate.

#### Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Viktor Simkovic whose telephone number is 703-308-6170. The examiner can normally be reached on Mon - Fri, 9:00 - 6:00, except every other Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Niebling can be reached on 703-308-3325. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-1782.

Viktor Simkovic January 28, 2003 Supervisory Patent Examiner Technology Center 2800